Exhibit D
to the
Declaration of Imran A. Khaliq in Support of Visto Corporation's Responsive Claim Construction Brief
(Patent Local Rule 4-5 (B))

Using Wireless Communications in Business

Andrew M. Seybold

Foreword by John W. Seybold

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DATA OVER CELLULAR

There is one more type of existing wireless infrastructure that can be used for data transmission—the standard analog cellular phone system. Many cellular phone users have tried sending faxes and data via cellular phones. Some seem to think it is an acceptable method, but those who need to get information through every time, without frustration, find it is not as easy as it sounds.

Cellular and Wireline

Since a cellular phone works very much like a wired phone, except that the signal travels over radio waves, one would think a standard wireline modem could be connected to a cellular phone, a number could be dialed, and the connection could be made just as with a standard telephone.

It is, however, important to understand the differences. Once a wired system is used to access a remote data point, the line (the connection) belongs to the user for the duration of the call. There may be some noise on the line, but generally lines are clean, and once the various telephone switches have been connected, users usually stay connected.

This is not the case in the world of cellular transmission. First, there is the matter of radio channels versus wired connections. The cellular system uses 832 different radio channels (half assigned to each of the two carriers in a given area), and each system is made up of a number of "cell sites" that use some of the channels.

Users connect to the cellular system from the cellular phone to the cellular site via radio. From the specific site, the call is routed to a master system switch over either radio (microwave) or wired connections where it is then handed off to the standard telephone system.

The portion of the connection from the cellular master system to the standard phone system works like a standard phone system. Inside the cell system, however, the routing can be changed numerous times during a call. If a user moves even slightly while using a cellular phone or drives a short distance, the call may be shifted to a different channel in a different cell. Even sitting still does not guarantee that the user will not be subjected to cell switching. This can occur because the system is constantly monitoring the quality of the circuit. If the circuit starts getting noisy, the system can make a determination to switch the call. Another reason for a switch is that someone else entered the same cell and was switched into this cell. The existing user may be switched to yet another cell to adjust the load.

Switching times are not really discernible in a voice call, but they can run as long as 300 milliseconds—enough to put a glitch in data sent at 9,600 baud or even 2,400 baud. For this reason, a series of special modems that use error-correction and data-compression schemes has been developed. The most common of these protocols is the Microcom MNP error-correction protocol. MNP version 5.0 is the currently accepted standard. Most modems designed for cellular data over existing analog phones are making use of MNP 5.0, some are becoming available for

future choice because it will take time for the cell sites in all the major metropolitan areas to be converted to permit the use of CDPD. Even more time will be required for the various cellular carriers to offer a nationwide seamless data system with a single bill at the end of each month.

Cellular analog voice systems have been in operation for more than ten years now, and users are still are not able to make calls from anywhere. Successful communications made outside the user's "home" area are charged a "roaming charge" that can run as high as $3.00 per day and $.90 a minute. The cellular industry has indicated its desire to provide nationwide CDPD coverage, and great strides have been made in this direction. However, not all cellular carriers are willing to spend the time and money involved in implementing CDPD until they see a demand for the service.

The cost of RF modems for use with CDPD is still in the $1,500 and above range. One modem, from Cincinnati Microwave, sells for under $300, but it is designed for CDPD use *only*—not for voice, analog data, *and* CDPD. It is best suited for point-to-point data transfers. There will be a huge market in this area for validating credit cards, monitoring the proper operation of a vending machine (the machine "tells" the dispatcher when it is empty or needs service), but for general public access, a CDPD-only modem does not make much sense.

Other issues must also be resolved if CDPD is to become a contender for mobile data usage. First, access must be nationwide and seamless. Second, the system must be an intelligent network that provides for easy access to users' own computing systems, as well as to many different types of information suppliers. Last, the existing rules governing the use of two phones with a single phone number must be amended.

The problem, briefly stated, is that each cellular phone is assigned both a phone number and an electronic serial number (ESN). This dual identification concept serves two very specific purposes. One is that carriers are assured that a subscriber does not use two phones with the same phone number, thus circumventing the monthly access charge. Another is that because both numbers must be verified, if a phone is reported stolen, it can never be used on any cellular system again. (Cellular phone thefts are almost non-existent, except by those who have learned how to illegally change the ESN).

As a result, if a user has a small handheld phone today and wants to take advantage of CDPD, he or she must either pay a second monthly access charge and obtain a second phone number for the CDPD-equipped unit, or get rid of the existing phone and use only the CDPD phone. Most users will not want to carry a complete computer and CDPD-equipped phone with them all the time. They will want to be able to carry their voice phone most of the time, and the CDPD phone when data transmission is important.

Users who are planning a wireless communications system in the immediate future should check on the latest status of CDPD-equipped cells in their area and the time frame for service availability for the other areas in which they will need coverage. They should also make sure to fully understand how the CDPD system works—including its possible limitations—before committing to a CDPD course of action.